



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

237. Proposed by S. A. COREY, Hiteman, Iowa.

Let  $AB, BC, CD, DE, EA$  be the sides of a pentagon, plain or gauche. Double the length of  $CB$  and  $DE$  by extending from  $B$  and  $E$  to  $G$  and  $H$ , respectively. Draw  $B'D$  parallel to and of the same currency as  $BC$ . Connect  $G$  and  $H$ . Then prove that  $2(AB^2 + BC^2 + CD^2 + DE^2 + EA^2) = 3CD^2 + 4(DE \cdot BC \cdot \cos EDB + EA \cdot AB \cdot \cos EAB) + GH^2$ .

238. Proposed by O. W. ANTHONY, Head of the Mathematical Department, DeWitt Clinton High School, New York.

Construct a trapezoid having given the sum of the parallel sides, the sum of the diagonals, and the angle formed by the diagonals.

---

### CALCULUS.

---

183. Proposed by W. J. GREENSTREET, A. M., Stroud, England.

Evaluate  $\int_0^\infty \frac{\sin 2nx dx}{(a^2 + x^2) \sin x}$ .

184. Proposed by W. J. GREENSTREET, A. M., Stroud, England.

If  $u = f(x, y)$ ;  $\xi = e^x y$ ;  $\eta = e^x$ ; show that

$$\frac{d^2 u}{dx^2} - y^2 \frac{d^2 u}{dy^2} - y \frac{du}{dy} = 4\xi\eta \frac{d^2 u}{d\xi \cdot d\eta}.$$

---

### MECHANICS.

---

121. Proposed by G. B. M. ZERR, A. M., Ph. D., Parsons, W. Va.

Prove that the electrical capacity of an oblate ellipsoid of revolution is  $\sqrt{(a^2 - b^2)}/\cos^{-1}(b/a)$ , where  $a$  and  $b$  are the equatorial and polar semi-diameters.

---

### AVERAGE AND PROBABILITY.

---

156. Proposed by J. E. SANDERS, Hackney, Ohio.

Find the average area of a triangle, the sum of whose sides is constant and equal to  $2a$ .

---

### DIOPHANTINE ANALYSIS.

---

122. Proposed by L. E. DICKSON, Ph. D., The University of Chicago.

If  $p$  is a prime  $(p^4 - 1)(p^2 - 1)$  has no factor of the form  $1 + p^3 x$ ,  $x > 0$ , if  $p > 2$ ;  $(p^6 - 1)(p^4 - 1)(p^2 - 1)$  has no factor of the form  $1 + p^5 x$ ,  $x > 0$ .